

Idaho Department of Environmental Quality

2002 Idaho Annual Report

EMAP Western Pilot Project Idaho River Intensive Study (REMAP)



December 2002

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Introduction

Cynthia S. Grafe, IDEQ Surface Water Programs

2002 Field Season Overview

For the Environmental Monitoring and Assessment Program Western Pilot (EMAP), the Idaho Department of Environmental Quality (IDEQ) sampled 16 sites from June through August 2002. This monitoring effort was led by Mark Shumar, the Idaho EMAP field coordinator, using a three-person crew. Dr. Robert Hughes (DYNAMAC), Dr. Philip Kaufmann (EPA-Corvallis, ORD), and Lil Herger (EPA Region 10) conducted the training that included classroom instruction and field practice. Two tribes, the Nez Perce and Shoshone-Paiute, participated in the training. Only one of the 16 sites, NNT to NF Pocatello Creek, was partially sampled due to dry conditions. About one-third of the sites (six sites) were not electrofished mainly due to permit limitations in anadromous waters. Table 3 lists the sites sampled this past field season while Figure 1 indicates site locations.

In addition to the EMAP monitoring effort, the Idaho river intensive study (REMAP) was initiated this year. IDEQ worked with EPA to develop a sampling design that met the study objectives and addressed logistical and resource limitations. The result was a rotating design over three bioregions (see Figure 2).

Dr. Hughes and Dr. Kaufmann returned to Idaho to conduct the training for nonwadeable protocols. For 2002, Bill Clark, the Idaho REMAP field coordinator, directed sampling of 19 sites within the Basin Bioregion (see Table 4 and Figure 2). Two of these sites (Snake River at Marsing and Rock Creek) were repeat sites. Additionally, four sites were considered reference for the Basin Bioregion. Of these reference sites, the Salmon River at Challis, Salmon River at Salmon, and Bruneau River near Indian Hot Springs were randomly selected. To obtain a representative fourth reference site, IDEQ hand selected the Snake River at Heise. Due to logistical and safety considerations, IDEQ contracted, using separate funding from EMAP, the U.S. Geological Survey (USGS) to perform the electrofishing on all the sites. As the REMAP study included wadeable and nonwadeable conditions, monitoring equipment was adjusted to collect samples. For instance, the USGS used backpack electrofishing equipment in wadeable conditions and boats for nonwadeable conditions.

For the 2003 field season, IDEQ anticipates that EMAP monitoring goals will be met using current budgeted resources. However, to meet REMAP monitoring goals, additional resources will be required to address expensive electrofishing costs, higher personnel rates, and greater needs for logistical support in remote areas. The following section describes these needs in greater detail.

Budget Status and Considerations

Overall, the 2002 field season expenditures were greater than budget projections by \$17,487. As seen in Table 1, these negative variances occurred in the personnel and operating/supply categories. IDEQ had anticipated some negative variances for 2002 due to the purchase of the REMAP rafting equipment for nonwadeable rivers. The cost for this rafting equipment (capital outlay) and associated supplies was \$10,385. The rest of the negative variances were mainly due to REMAP personnel and general operating (office rental and vehicle) expenses exceeding budget projections. Expenditures for the entire project period (2000-2002) are approximately the same as budgeted with only a small negative variance (see Table 2). IDEQ anticipates REMAP personnel expenses to be slightly less in 2003 due to greater familiarity with the nonwadeable protocols and improvement of logistical planning. However, it is apparent that overall staff salaries, personnel hours, and general operating expenses are significantly higher than 2000 projections. If current spending levels continue, particularly for the REMAP project, IDEQ will incur significant negative variances.

Table 1. Field Season 2002 Expenditures vs. Budget

Budget Item	Expense	Budget	Variance
Personnel + Fringe Benefits	90,806	84,858	(5,948)
Travel	8,639	8,720	81
Operating and Supplies	25,523	15,776	(9,747)
Capital Outlay	7,134	7,134	0
Contractual	0	0	0
Indirect (Overhead)	35,500	33,626	(1,874)
<i>Total</i>	<i>\$167,601</i>	<i>\$150,114</i>	<i>\$(17,488)</i>

Table 2. 2000- 2002 Expenditures vs. Budget

Budget Item	Expense	Budget	Variance
Personnel + Fringe Benefits	129,583	116,168	(13,415)
Travel	12,292	18,800	6,508
Operating and Supplies	34,918	35,115	197
Capital Outlay	7,724	0	(7,724)
Contractual	777	17,000	16,223
Indirect (Overhead)	50,853	48,228	(2,625)
<i>Total</i>	<i>\$236,146</i>	<i>\$235,311</i>	<i>\$(836)</i>

EMAP Budget Considerations

The 2002 Idaho EMAP field season was within the budget of \$66,028 although personnel expenses had a low negative variance (\$1,380). This negative personnel variance was offset by a positive operating variance of \$1,557. It is anticipated that operating expenses will be higher next field season due to several expensive pieces of

equipment needing to be borrowed or purchased. These include an electrofisher, GPS, satellite phone or CB, flow meter/rod, and digital camera. Also, IDEQ continues to evaluate the advantages and disadvantages of a four-person crew.

REMAP Budget Considerations

The 2002 Idaho REMAP field season resulted in expenditures over \$100,000, well above budget projections of \$84,086. If USGS contracted electrofishing expenses are included, the total cost of the nonwadeable REMAP project was \$176,538 or about \$9,300/site. As mentioned previously, IDEQ anticipated higher expenses due to the purchase of rafting equipment, however personnel hours and overhead expenses were significantly higher than 2000 projections. In addition to these higher expenses, IDEQ anticipates that several expensive pieces of equipment will need to be borrowed or purchased next year. These include a GPS, a range finder that exceeds 200 meters, a plankton net and bucket, two way radios, PFDs, and a satellite phone.

Purchase of a boat electrofisher will be needed if IDEQ undertakes the electrofishing in future years. IDEQ found contracting of the electrofishing in nonwadeable rivers to be extremely expensive. IDEQ contracted USGS to perform the electrofishing on 19 sites. Using separate funding from EMAP, IDEQ spent approximately \$75,000 or \$3,950/site just on electrofishing. It should be noted that this cost was part of a cooperative agreement with the USGS that used matching funds. Consequently, the total cost for the electrofishing effort was actually \$150,000 if matching funds are considered. IDEQ will not have the option to use this funding source for 2003.

Another budgetary consideration is the greater logistical support requirements to sample in the Central and Southern Mountains Bioregion. This bioregion is dominated by the Salmon River drainage of which a major portion is in wilderness and inaccessible canyon areas. To appropriately estimate water quality conditions in this bioregion, IDEQ will need outfitter support to access these remote areas. Specifically, reconnaissance investigations in October 2002 indicate outfitter needs to sample the Middle Fork of the Salmon River and some portions of the Salmon River.

Given the considerable expense needs of sampling nonwadeable rivers, particularly in remote areas, IDEQ will be evaluating various options and requesting supplemental funding from EPA. In particular, IDEQ will evaluate funding options to meet electrofishing needs and logistical support requirements for the Middle Fork of the Salmon and Salmon River sites.

Background

Since the early 1990's, IDEQ has been developing a bioassessment program (Beneficial Use Reconnaissance Program-BURP) focused on monitoring biological and physical habitat parameters. Similar to the Idaho program, EMAP uses direct measures of ecological condition to assess water quality conditions, particularly

aquatic life uses. EMAP also uses a probability survey design that allows unbiased estimates of statewide water quality conditions. IDEQ decided to participate in the EMAP western pilot to learn more about this type of survey design as well as improve its BURP biomonitoring and assessment techniques.

In 1999, Idaho IDEQ collaborated with EPA to complete the Site Evaluation Study for Idaho perennial and non-perennial streams in the EPA River Reach file, Version 3 (RF3). This study was the basis for selecting candidate sites for the western pilot. IDEQ completed the office and field reconnaissance tasks for over 300 sites.

In April 2000, IDEQ submitted a grant application for the ecological assessment of Idaho streams and rivers using EMAP methods. The project period for this grant was June 1, 2000 through May 31, 2005. Funding for this project covered monitoring of 50 EMAP sites, as part of the western pilot, and implementing a regional study for Idaho rivers (REMAP).

For the first year (2000), IDEQ did not request funding to implement the field monitoring. Instead, IDEQ requested assistance to attend the EPA training of its contractors (conducted in Corvallis), observe field monitoring conducted in Idaho, and provide assistance to the EPA contractors. This allowed IDEQ to learn more about the EMAP methods and prepare for implementation in 2001. IDEQ also did not initiate the river special study (REMAP), as funding was not received until late in 2000.

In 2001, IDEQ conducted its first field season as a participant in the EMAP western pilot. EPA provided training that included participation by the Nez Perce Tribe. Darcy Sharp served as the field coordinator for this effort and used a four-person crew (including herself) to monitor 15 sites. Four of the target sites were not monitored by IDEQ because they were nonwadeable, dry, or inaccessible. It was decided in 2000, that the EPA contractor would monitor nonwadeable Idaho sites selected as part of the EMAP western pilot. IDEQ also did not initiate the river special study at this time since this study entailed considerable resource and logistical planning and Cyndi Grafe was on leave.

EMAP-West: Idaho Wadeable Streams Portion

Mark L. Shumar, IDEQ State Technical Services Office

Site Reconnaissance and Landowner Permission

In general, the process of site verification and landowner permission takes about 80 hours. Stream names and site locations were obtained from an EPA spreadsheet in the spring of 2002. Latitude and longitude in decimal degrees described site locations. Using TopoZone.com, a visual representation and quadrangle map location could be found quickly by plugging in the decimal degrees. Quadrangle topographic maps (1:24,000) or 1:100,000 maps could be used to quickly ascertain if the site was on public land (BLM or Forest Service). From the quad maps, the site location was converted to township, range and section quarters. This conversion was necessary to enhance the process of finding landowners.

If the site was believed to be on public land, the BLM District or Forest Ranger District Office was called to confirm. At the same time, a discussion with the forest hydrologist or fish biologist was started to learn the accessibility of the site, its potential flows, and any features of concern/sensitivity.

If the site was believed to be on private land, the county assessor's offices for the respective location was called to identify the landowner. Most county assessor's office required that site location be given to them as township, range and quarter section. Most assessors received the request and supplied the results over the phone.

Subsequently, both a phone call, letter, and FAQ sheet (see Attachment 1) were sent to the landowner requesting permission to enter his/her property and to sample the stream at the specific location identified on a map (included with the letter). In some cases, many phone calls were placed before contact was finally made. No written correspondence was received from any landowner. For primary sites, permission to enter was granted for all but one private site (Big Timber Creek). For alternate sites, permission was denied on three sites (Big Eight Mile Creek, Blue Creek, and Soldier Creek), the landowner was not found for one site (SF Hoopes Creek), and BLM indicated that access to WF Cold Springs Creek was too far to hike.

Equipment and Supplies

Most of the equipment and supplies needed for EMAP were ordered in early June 2002. Most items were received before training started on June 17, 2002; however, it would be better to order earlier. Most of the equipment needed for an EMAP crew is now available for future use. However, there are still several items that need to be borrowed or purchased for next year. They include a waterproof camera (a digital

camera would be nice), a handheld GPS unit, an electrofisher and associated gear (dip nets, anode rod, batteries, charger), a flow meter and wading rod, and a hand pump filtration kit.

Additional items that were not considered in 2002, but should be included in 2003 include communication devices. A CB is important for traveling logging roads. A satellite phone should be provided for emergency and logistical problems that may arise. If a satellite phone is not obtainable, then a cell phone with the largest possible in-state access area should be provided. A pair of walki-talkies would also be beneficial for the crew to contact each other when separated by thick brush or a long stream reach.

Permits

An Idaho Department of Fish and Game (IDFG) permit for scientific collection of fish by electrofishing was applied for in early June 2002. The permit was in William H. Clark's name and one EMAP crew member (Libby Hardin) was a sub-permittee. Although it takes time to apply for this permit, it cannot take place until you have crew member names to be placed on the permit. No permit from NMFS to sample in anadromous waters was applied for given the long time period (six months to a year) required to obtain such a permit. A mandatory report was submitted to IDFG at the completion of the field season documenting where fishing occurred and what was caught.

Training

Because crew members generally have little knowledge of bioassessment concepts and training time is limited, it would be helpful to focus training on performing the field protocols rather than discussing the theories supporting the protocols. Specifically, we suggest more time describing how to do the technique from the perspective of a novice person. For instance, the classroom portion of the training would detail for novice field personnel each sampling method, the tools used, and how the information is recorded on the field sheets. This would greatly enhance the field portion of the training, as crew members will then have some idea of what is expected of them before they get to the field training session. Also, it would be helpful if the trainers explained each measurement activity and allowed the crew to observe the trainers actually implementing the protocols in their entirety.

Field Work

Sites Completed

The 2002 EMAP crew sampled 16 sites around the state (see Table 3). All sites were wadeable and sampleable. The first site, NNT to NF Pocatello Creek, was only partially sampleable as water was found at only one transect. Ten sites were

electrofished and six were not. Of those sites not fished, four were not fished because they were anadromous waters, one was not fished because of inclement weather, and one was mostly dry.

There was difficulty locating the X-site on three sites. Wapiti Creek X-site was difficult to locate because of thick riparian brush and a GPS with low batteries providing potentially erroneous data. We believe that the actual reach sampled is at least partially within an area that would have been included in the original X-site reach. There were abundant beaver ponds at the SF Toponce Creek location, and the X-site was moved to accommodate access to the stream. The third site involving location problems was Prospector Creek. The X-site on Prospector Creek was within a very steep canyon with access restricted by extensive large woody debris, devil's club, and thick riparian vegetation. The crew penetrated as far as they reasonably could and sampled the stream. More training concerning X-site locations and reach determinations would be helpful.

Table 3. Wadeable stream EMAP sites sampled in 2002.

Name	Site ID	Date Sampled	Fished?	Comments
Shovel Cr.	WIDP99-0605	8/13 – 8/14	Yes	Repeat site
Breakfast Cr.	WIDP99-0690	8/5 – 8/6	Yes	With R. Henderson
North Cr.	WIDP99-0694	7/8 – 7/9	Yes	Lots of sculpin
East Camas Cr.	WIDP99-0695	7/17 – 7/18	Yes	Near Kilgore
Wapiti Cr.	WIDP99-0697	7/1 – 7/2	Yes	GPS low battery, possible location problems
Lapwai Cr.	WIDP99-0698	7/22	No	Tribe observed, anadromous water
Hangman Cr.	WIDP99-0699	7/31 – 8/1	Yes	Trash in creek
NNT to NF Pocatello Cr.	WIDP99-0700	6/25 – 6/26	No	Partial – water at one transect only
Mike Spencer Canyon	WIDP99-0701	7/15 – 7/16	Yes	Cold water, no fish
Yankee Fork	WIDP99-0724	8/12	No	Anadromous water
NF Reeds Cr.	WIDP99-0725	8/7 – 8/8	Yes	Near Headquarters
WF Potlatch R.	WIDP99-0726	7/23	No	Low gradient meadow, anadromous water
SF Toponce Cr.	WIDP99-0727	7/10 – 7/11	Yes	Beaver dams, location problems
Prospector Cr.	WIDP99-0729	7/29 – 7/30	Yes	1 st alternate, location problems
NNT to NF Gold Fork R.	WIDP99-0737	8/20 – 8/21	No	2 nd alternate, inclement weather
American R.	WIDP99-0738	8/19	No	2 nd alternate, anadromous water

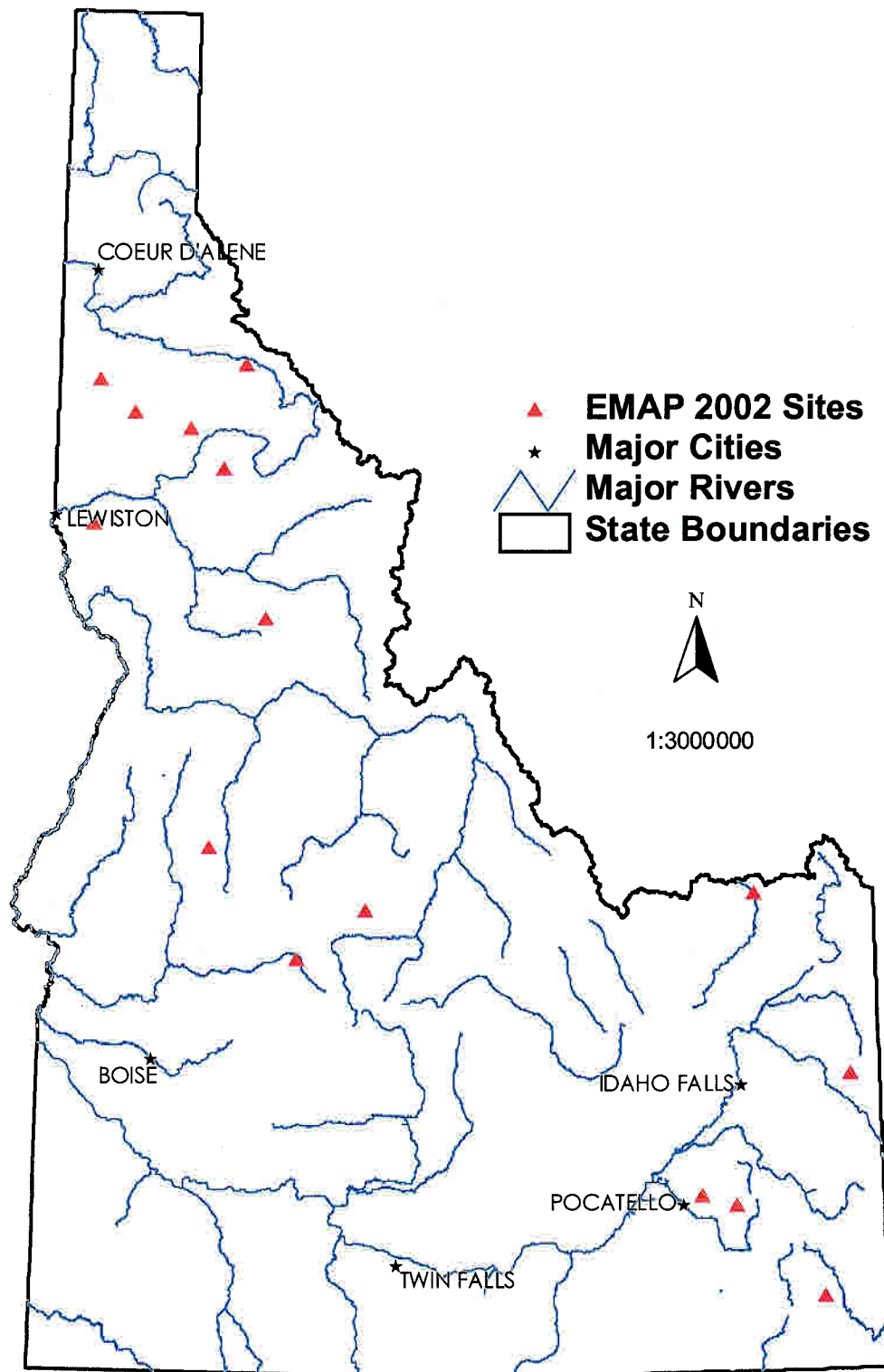


Figure 1 Map of Idaho showing 2002 EMAP sample sites (red triangles).

Scheduling and Field Logistics

The crew was scheduled to sample two sites per week. Given travel and sampling time, it was estimated that no more than two sites could be done within a 40-hour work week. The crew worked in the field for nine weeks. Only one site was completed in each of the first two weeks because of the learning curve and the 4th of July holiday. Two sites were done per week for the remaining seven weeks. The crew rarely accrued overtime and only occasionally had less than a 40-hour workweek.

The crew worked very well together and established routines quickly. The crew preferred to maintain the same job throughout the season, in other words, the same two people did the physical habitat measurements, and the third person always did the benthos sampling. Having one person be responsible for two macroinvertebrate samples, two periphyton samples, flow, and sometimes water chemistry was sometimes onerous. Having an occasional fourth crew member provided some relief. All three crew members would participate in fishing, swapping jobs periodically at a site because the backpack was heavy. The crew had difficulty identifying fish to species, and had difficulty accurately photographing fish for vouchers. Most trout photographs were of poor quality and it is unlikely that fish identification can be accomplished with these photographs. The primary problem appears to be associated with the camera not focusing on the fish when shot at close range. A digital camera, where the image can be seen before the picture is taken, or reviewed afterwards and taken again if necessary, would help this problem.

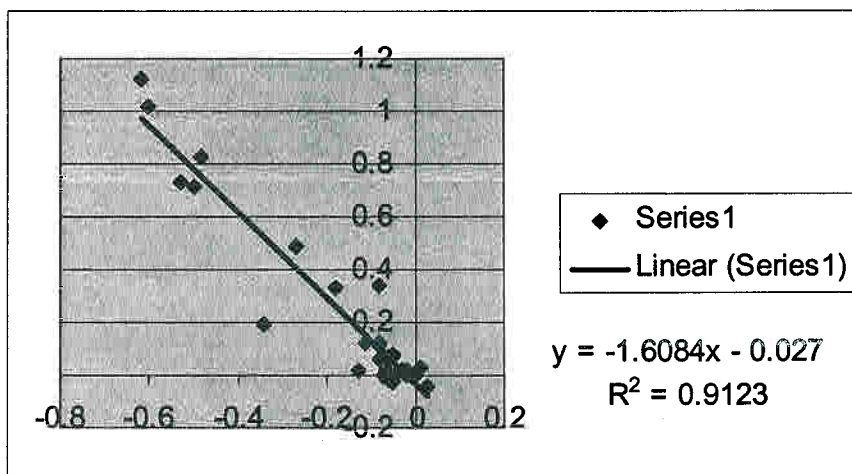


Figure 2 Regression equation to adjust flow measurements.

There were several sampling problems, most notable was the inappropriate use of the wading rod for flow measurements. The wading rod with meter bulb attachment was used backwards for a major portion of the season. When the mistake was discovered, we took measurements at several streams using the rod in both directions. Then a

regression (seen above) was developed to correct the flows to more appropriate positive numbers. Old, incorrect flow values are inserted into the equation for X and the new, corrected flow results as Y. All flow data recorded on field forms at the erroneously sampled sites are corrected values using this regression equation.

Regarding data field forms, the benthos form was routinely damaged (wet, wrinkled, folded, etc.). This results from the benthos person having to carry and work with two kick nets and two periphyton samples. The benthos person was encouraged during training to fold the form and put it into a shirt pocket to carry. This advice further degraded the form. Subsequently, the form was carried in a metal datum case, but still tended to suffer more abuse than other forms in the package. The physical habitat section had the luxury of devoting one person to recording data on forms and the other person performing key measurement activities. Thus, the habitat forms tended to stay neat and clean.

Recommendations

It is strongly recommended that training be conducted in a different manner; a manner that is geared towards instructing novice personnel on the details of this kind of sampling and recording. It is also recommended that communication devices be secured for field personnel in cases of emergency.

It is difficult for a three-person crew to perform these tasks week after week. The benthos person has a lot of work to do and can become stressed. With a technical service staff person joining the crew half time, this stress is relieved at least half the time. It is strongly encouraged that this fourth crew member arrangement continues or be expanded. Three people can perform these tasks; however, they are stressed by the amount of gear that must be carried and by some of the tasks that end up being completed by one person. If hiking distances are increased in future seasons, and crew members are not always stout individuals, three-person crew can be a problem. Additionally, it is strongly recommended that two vehicles be planned for the EMAP crew to accommodate four people.

Equipment and supply needs should be reduced from previous seasons. However, decisions on how to acquire the needed equipment should be made earlier.

REMAP: Idaho River Intensive Study

William H. Clark, IDEQ State Technical Services Office

Study Design Considerations

For 2002, the REMAP study area covered large rivers in southern Idaho's Basin Bioregion. EPA randomly selected fourth order or greater streams within three bioregions defined by IDEQ. These bioregions were ecoregional groupings found to be reasonable classifications (Jessup and Gerritsen 2002). IDEQ then used its water body size criteria (Grafe 2002) to select large enough streams for the study. Specifically, selected rivers must meet two of the following three criteria: fifth order or larger, 15+ meters in wetted width, and/or must be a minimum of 0.4 meters in depth.

Field Methods

Field methods followed those given in Peck et al. (2002). A few major changes to the EPA operations manual were made by IDEQ. These changes included establishment of a study reach length by taking 40X the wetted stream width rather than 100X which was done for logistical and resource considerations. The USGS did a comparison of 40X and 100X for three sites and will report those data at a later date. Another change was to divide the study area into three bioregions for logistical and resource considerations. Also, the USGS was contracted by IDEQ to conduct the electrofishing because of separate budget considerations.

Site Reconnaissance and Landowner Permission

For a variety of reasons (time, season, more than one entity involved in field work, etc.) not all of the potential sampling sites could receive proper reconnaissance prior to the field season and prior to sampling. The change in the project study design precluded reconnaissance during summer/fall low flow periods similar to what would be expected for actual sampling. To improve monitoring efforts in 2003, we conducted reconnaissance on 2003 accessible sites during base flow conditions (October 2002). Two people spent two and a half weeks conducting the reconnaissance.

Because of the nature of large rivers (size, multiple ownership, and availability of public land, bridges and other crossings and access for sportsmen) landowner permission was normally not an issue. Landowner permission was only needed on three of the river sites (Big Lost River, Portneuf River at Topaz and the Blackfoot River). The normal concerns relating to data use were expressed by landowners prior to granting permission. The Blackfoot River site was a bit more complicated. The river forms part of the northern boundary of the Fort Hall Indian Reservation and therefore, the sampling required a special "permit to trespass."

Staffing

One person hired turned out to not be appropriate for the river field work. This was not totally apparent until we were into a couple of weeks of field work. The crew member removed himself from the field crew and spent the rest of the REMAP time period assisting Water Programs with errands. By this time the other three crew members had a good system and continued doing the work without problem. Often they worked with USGS for safety. I participated with them when time was available, for both safety and insuring that the work was done properly.

Equipment and Supplies

The equipment used for REMAP 2002 included that already owned by IDEQ, that purchased specifically for the REMAP sampling, that borrowed from EPA Corvallis, and that leased. The following equipment was borrowed from EPA: GPS, plankton net, and syringe. I recommend purchase of these items by IDEQ for next year.

Equipment purchased this year included waterproof 35mm camera (I suggest purchase of a digital camera), waterproof binoculars, first aid (trauma) kit, kick nets, sample coolers, measuring tapes, algal filtration pump, sonar gun, densimeters, compasses, clinometers, thermometers, pH instrument, and numerous smaller items. Duplicate equipment was purchased where possible to serve as field back-up. We leased a satellite phone for emergency use only and it was not used. I recommend purchase of a satellite phone in the future as that would be cheaper than lease and it would be available for other IDEQ use.

Water Programs loaned the following equipment to the project: two two-way radios, 0-200m laser rangefinder and several personal flotation devices (PFDs). Most crew members had their own personal PFDs. I recommend REMAP purchase these items for the future, especially a laser rangefinder with a range greater than 200m which IDEQ currently does not own.

For electrofishing, no electrofishing equipment and only a few supplies are covered in this report as they were the responsibility of USGS. I recommend that IDEQ do the electrofishing in future years.

Two 4x4 pickups with shells were necessary because of the need to shuttle between the put in and take out of the river sites and because a large amount of equipment, supplies, and boat trailer had to be transported. The vehicles were equipped with appropriate safety and emergency equipment and supplies. Extra keys were purchased for the vehicles to insure no lost time because of accidental lock out. Both vehicles were equipped with towing packages (trailer hitch, ball, and lights) so that either could transport the rafts and trailer. The two-way radios were very useful for logistical coordination between the vehicles and crew.

White-water rafts were selected for the field work. Water Programs purchased two Maravia Diablo 14' rafts with oar frames for this work. Two large dry boxes kept needed equipment and supplies dry and in good condition. Water Programs also had a trailer custom built to haul the rafts and additional storage was built in for safe rafting equipment storage. Emergency and repair equipment and supplies were purchased for safety and to help minimize any lost time. An additional small (10') lightweight paddle raft (Sevylor, Caravelle K105) was purchased to use as an equipment barge when the river was too small to accommodate the larger rafts.

Permits

Several permits are relevant to large river monitoring in Idaho. EPA did a Section 10 permit with the US Fish and Wildlife Service for fish. Invertebrates were not included in their permit. I suggest that they include invertebrates in the future.

Federal permit for sampling activities on the Snake River may be required because of threatened and endangered species of gastropods (snails). The Bliss Rapid snail is found in the Hagerman area and the Idaho springs snail occurs in the general area of the Snake River between Glens Ferry and Weiser. Because the *Utah valvata* is much more restricted in distribution is precluded our sampling of the site near Walcott. Because of the short lead time and considering the relatively small area of sampling disturbance, US Fish and Wildlife Service did not require permits for our work at Hagerman, Murphy, and Marsing. We will share our macroinvertebrate data with USFWS when it is received back from EcoAnalysts, Inc., and can thus help understand the distribution and ecology of these snails.

We obtained Scientific Collecting Permits from IDFG for our electrofishing efforts this field season. Terry Maret (USGS), as the primary subpermittee, will submit the final report to IDFG and to EPA concerning the fish results for 2002. A steelhead fish permit will be required from IDFG for the 2003 REMAP sampling.

Training

In addition to general IDEQ orientation, specific crew training included a two-day River Rescue Course (including Z drag, strong swimmer, snag line extraction, and river hydrology) and one day of Medic First Aid Mark IV (first aid and CPR) training.

The entire crew had a full week of EMAP-WEST Field Protocol Training conducted by Dr. Robert M. Hughes (DYNAMAC) and Dr. Philip Kaufmann (EPA-Corvallis, OR). The EPA training included classroom and field training. Two days were spent in the classroom with the end of the second day being a field demonstration at the Boise River at Glenwood Bridge. The next three days included intensive field training that

involved orientation to the rafts, establishing field routines, and describing field protocols.

Field Work

Field methods followed those given in Peck et al. (2002). Some major changes to the EPA operations manual were made by IDEQ. These changes included establishing a study reach length by taking 40 times the wetted stream width rather than 100 times which was done for logistical and resource considerations. USGS did a comparison of 40X and 100X for three sites and will report those data at a later date. Another change involved dividing the Idaho REMAP sampling into three bioregions. Also, the US Geological Survey was contracted by IDEQ to conduct the electrofishing. All sites were electrofished. Even the nearly dry Big Lost River produced fish, three whitefish.

The 2002 REMAP crew sampled 19 sites in the Basins Bioregion (Figure 2, Table 4). The study design included repeat and reference sampling to allow data interpretations by bioregion. The site above Marsing on the Snake River was sampled two times. It was the first and nearly the last site sampled for an estimate of temporal variability. Two sites were selected by hand (non random). One was Rock Creek at Daydream Ranch, just downstream of the Rock Creek at Twin Falls site, to help evaluate spatial variability. The second hand selected site was the Snake River at Heise which was chosen to help with comparative reference (least impacted) conditions for southern Idaho large rivers.

The sites ranged in size from small to large and included the nearly dry, the Big Lost River site. This river can be high during runoff events, but is severely impacted by water diversions and withdrawals for irrigation. Several sites were partly wadeable (Rock Creek, Bruneau River, Owyhee River, and Portneuf River) and the medium-sized rivers were mostly non-wadeable (Bear River, Blackfoot River, Payette River, Salmon River and Weiser River). Large river sites that were sampled entirely with rafts were the five Snake River sites. Table 4 lists the sites sampled for the 2002 field season.

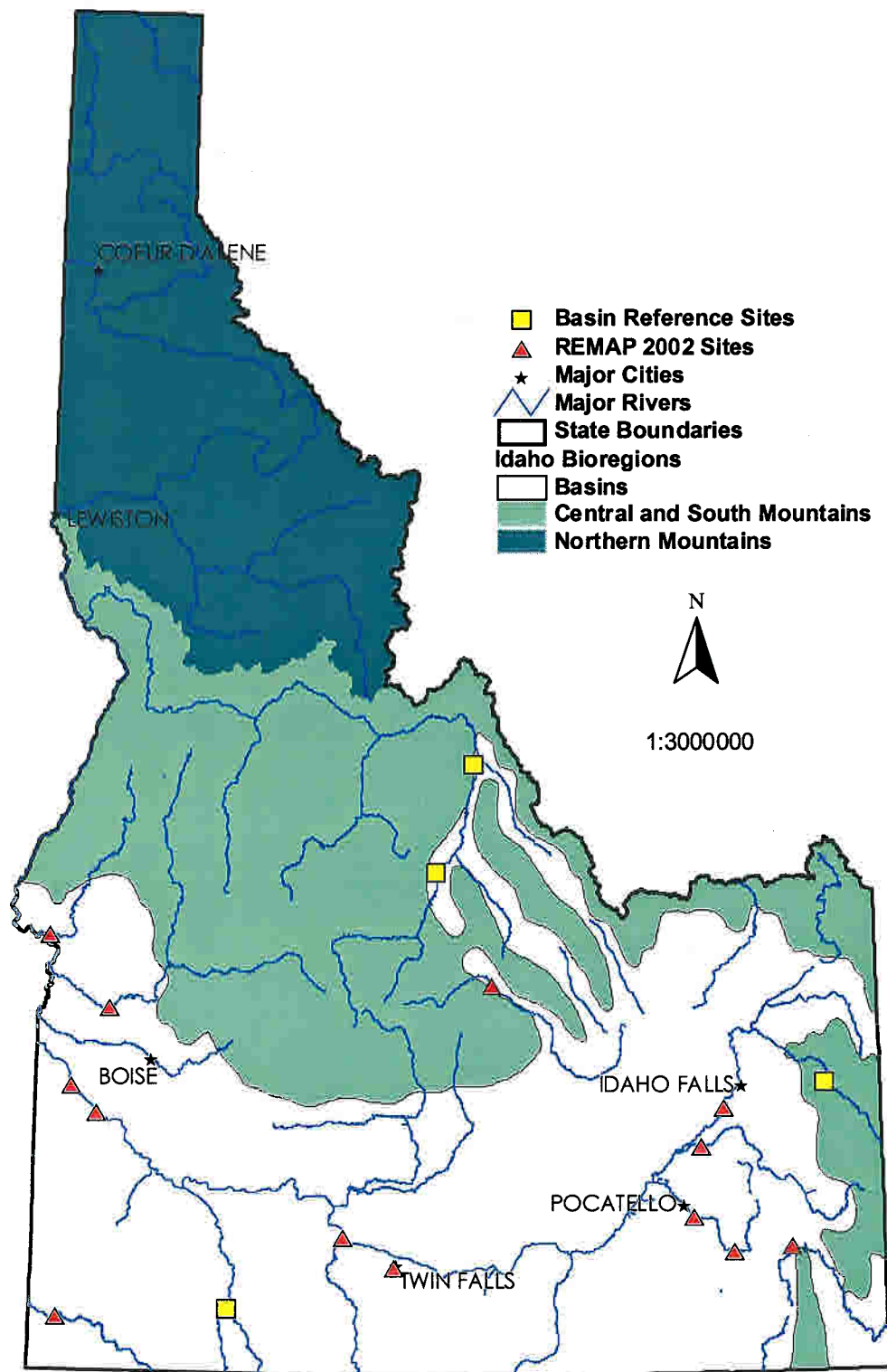


Figure 3. Map of Idaho showing 2002 REMAP sample sites (red triangles) including reference sites (yellow squares).

Table 4. REMAP 2002 Sites

SITE ID	RIVER NAME	DATE	COUNTY
IDW02353-026	SNAKE R – MARSING	8/1	CANYON
IDW02353-001	ROCK CR – TWIN FALLS	8/5	TWIN FALLS
IDW02353-HSSD	ROCK CR – DAYDREAM R* (HS)	8/6	
IDW02353-050	SNAKE R – HAGERMAN	8/7	TWIN FALLS
IDW02353-070	PORTNEUF R – POCATELLO	8/13	BANNOCK
IDW02353-029	SNAKE R - SHELLEY	8/14	BINGHAM
IDW02353-103	WEISER R	8/20	WASHINGTON
IDW02353-131	PAYETTE R – EMMETT	8/21	GEM
IDW02353-079	SALMON R – CHALLIS (R)	8/27	CUSTER
IDW02353-092	SALMON R – SALMON (R)	8/28	LEMHI
IDW02353-017	BIG LOST R	8/29	CUSTER
IDW02353-037	BEAR R	9/4	CARIBOU
IDW02353-130	PORTNEUF R – TOPAZ	9/5	BANNOCK
IDW02353-HSSD	SNAKE R – HEISE (HS) (R)	9/11	
IDW02353-009	BLACKFOOT R	9/12	BINGHAM
IDW02353-032	OWYHEE R	9/17	OWYHEE
IDW02353-077	BRUNEAU R, W FK (R)	9/19	OWYHEE
IDW02353-026	SNAKE R – MARSING*	9/24	CANYON
IDW02353-115	SNAKE R – MURPHY	9/26	CANYON

* Repeat Site (HS) Hand Selected (R) Reference

The crew was able to sample from two to three sites per week with the crew working some overtime when necessary. Time spent at a river site ranged from half a day to a full day plus, depending on the size of the study reach and other logistics. The crew camped out the entire time with the exception of two nights spent in motels during bad weather. I traveled with the crew for the first two weeks to be sure they were following proper procedures. Later I helped them with field work following departure of one of the crew members.

Recommendations

I recommend that the REMAP monitoring continue with little change. Major suggested changes include purchasing the following equipment: GPS, rangefinder that exceeds 200 meters, plankton net and bucket, two way radios, PFDs, and a satellite phone. Purchase of a boat electrofisher will be needed if IDEQ undertakes the electrofishing in future years.

Recommendations for training include: have crew read manual before training, have packet of data sheets, labels, sample containers and equipment on hand for lectures, conduct detailed training on sample shipment and include a fact sheet in the field operations manual, include a one page sample reach sequence fact sheet available, and practice with the field sheets during training.

Recommendations made for the field sampling include: preserve benthos as they are sampled, improve benthos sampling intensity to better sample mollusks, keep algal sample in cooler during the sampling day, foam holders in the rafts helped secure bottles (algae and benthos samples, etc.) and keep them from spilling, do not evaluate physical habitat variables from the opposite banks (especially in wide rivers), add some of Idaho's most common invasive alien plants to data form, and improve the plankton bucket.

Appendix A. REMAP Sample Shipping Instructions

All samples are to be shipped in coolers (48 qt seems to work well). The coolers should have their drain plugs sealed shut and should have two layers of plastic garbage bags as liners. Pack as much ice (a mix of block and cube ice is best). All ice should be placed into two plastic garbage bags also. The lid should be fastened down with duct tape and should be sealed with the tape also. This is done to eliminate water leakage.

Below is a list of the information needed when (or before) the samples are shipped FEDEX to: US EPA, 1350 Goodnight Avenue, Corvallis, Oregon 97333.

SITE ID

NAME of site

DATE the site was visited

SITE status (wadeable, dry, etc.)

TRACKING number (for FED-EX, this is a 12-digit number at the top of the FEDEX Airbill)

DATE the samples were shipped

SAMPLE ID, TYPE, COMMENTS for each fresh sample

For FISH samples, include size (e.g. small, large) and species of fish. (Include in phone message only if being shipped)

SAMPLE ID, TYPE, COMMENTS for each preserved sample (e.g. number of jars for benthos samples) (Include in phone message only if being shipped)

The Field Sample Shipment Packing/Tracking Form should be completed, placed in a plastic bag and attached with tape to the inside of the cooler lid. All samples should be listed, included preserved samples (macroinvertebrates and fish) not now sent.

You may fax (541-754-4338, ATTN: Marlys Cappaert) or call [use the message line, 541-754-GOOD (4663)] to leave the sample information.

All field forms should be mailed to: Marlys Cappaert, Computer Sciences Corporation, 200 SW 35th Street, Corvallis, OR 97333.

✓ Idaho Department of Environmental Quality FEDEX Account Number: 1209-3912-2.

✓ #2, FEDEX Form (Your Internal Billing Reference): EMAP 0503 82128 5023 540 63.

Attachment 1. Idaho EMAP FAQ Sheet

EMAP-West

Water Quality Assessment in Idaho and its Neighboring States

What is EMAP-West?

EMAP stands for Environmental Monitoring and Assessment Program. The Western Pilot program—EMAP-West—is a four-year pilot study involving twelve states in the western U.S. It is a cooperative effort among EPA, the States, and Tribal Nations. In Idaho, the lead state agency is the Department of Environmental Quality (DEQ).



EMAP-West uses a randomized sampling design to assess the condition of coastal waters, inland surface waters and landscape characteristics. This program aims to advance the science of environmental monitoring. With better information, we can evaluate water quality better. We can also improve our decisions about how and where to spend resources on the environment.

Why do we need EMAP-West?

Various federal, state and tribal agencies already sample and monitor the surface waters of Idaho. But there is no nationally consistent methodology in place, making the comparison of results difficult. EMAP aims to provide a “big-picture” profile of ecological conditions in the west. Most current programs employ targeted sampling, which focuses on specific sites and particular problems and does not attempt to evaluate the overall condition of aquatic resources. EMAP employs a rigorous probability survey design that allows extrapolation of results

from randomly-selected samples to the entire water body system. Some traditional sampling and monitoring programs have also been criticized for their exclusive focus on physical and chemical properties of the water. EMAP uses a richer suite of indicators to assess the health of water bodies, including biological and landscape characteristics.

For More Information Contact Idaho DEQ:

Idaho EMAP Lead

Cyndi Grafe208-373-0502

Boise Regional Office

Angie Petersen208-373-0550

Coeur d'Alene Regional Office

Glen Pettit208-769-1422

Lewiston Regional Office

Daniel Stewart208-983-0808

Pocatello Regional Office

Dave Hull208-236-6160

Idaho Falls Regional Office

Steve Robinson208-528-2650

Twin Falls Regional Office

Sean Woodhead208-736-2190

Technical Services Office

Mark Shumar 208-373-0132

Bill Clark 208-373-0263



What will EMAP help us to do?

EMAP will help us better understand the general water quality condition of Idaho streams and rivers. The DEQ monitoring methods are very similar to the EMAP methods. We expect that there will be some technology transfer between the two efforts that will ultimately improve monitoring and assessment in Idaho.

In addition, nationally consistent methods for the collection and analysis of data will allow comparison of data over time and across states and regions. This will help us to identify trends and establish priorities.



What is the public's role in EMAP?

Idaho's waters exist on both public and private lands. Over the next four years, approximately 100 randomly selected sites will be sampled in Idaho. In order for the EMAP research design to accurately represent those waters, it must include samples from waters on both public and private lands. DEQ scientists and technicians will be asking landowners' permission to access sampling locations. DEQ will not enter these areas without the landowner first granting permission. Please be generous in granting access to sampling sites.



Some of the sampling variables

Water Chemistry

- All major ions (base cations, sulfate, chloride, nitrate)
- Alkalinity, pH, conductivity
- Nutrients—nitrogen, phosphorus, silica
- Dissolved Inorganic Carbon, Dissolved Organic Carbon
- Dissolved metals—selenium, zinc, aluminum
- Total suspended solids
- Turbidity

Physical Habitat and Landscape

- Channel characteristics
- Substrate characteristics
- Riparian vegetation
- Fish cover and large woody debris
- Human influence
- Watershed/Landscape characteristics

Biological Indicators

- Algae (periphyton)
- Aquatic insects (macroinvertebrates)
- Fish

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